

**REMARKS**

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1-2, and 4-14 are currently pending in this application. No new matter has been added by way of the present amendment. Claims 1, 4, 6 and 9 have been amended to more clearly recite the features of the present invention and to correct informalities identified by the Examiner. These amendments are non-narrowing in nature. Accordingly, no new matter has been added.

In view of the amendments and remarks herein, Applicants respectfully request that the Examiner withdraw all outstanding rejections and allow the currently pending claims.

**Issues Under 35 U.S.C. 102/103**

**EP '038**

Claims 1, 4-7 and 9-10 stand rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over EP 1,130,038 (hereinafter EP '038). Applicants respectfully traverse.

The Examiner asserts that EP '038 discloses a curable composition comprising (A) a polymerizable monomer, (B) a polyfunctional monomer, (C) a difunctional polymerizable monomer and (D) a photochromic compound.

The Examiner takes the position that the cured product of the compositions disclosed by EP '038 would inherently have tensile strengths of 20 Kgf, or “for those who do not have said strength, have tensile strengths close enough to said strength that it would have been obvious for one of ordinary skill in the art to optimize the ratio of monomers to achieve a product with higher

tensile strength”. Moreover, the Examiner asserts that “[a]lthough ‘038 is silent with regard to a cured product with a photochromic compound having a fading half-life of less than 30 times the half-life found in the curable composition....the compositions inherently possess such properties”.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Additionally, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *Id.* The Supreme Court of the United States has recently held that the "teaching, suggestion, motivation test" is a valid test for obviousness, albeit one which cannot be too rigidly applied. *Id.* Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rationale underpinning to support the legal conclusion of obviousness. *Id.*

The present invention is directed, *inter alia*, to a photochromic lens substrate and a polymerization curable composition for a photochromic lens substrate (see, for example, independent claims 1 and 6). The presently claimed polymerization curable composition comprises (I) a polyfunctional polymerizable monomer of formula (1); (II) a bifunctional

polymerizable monomer of formula (2); (III) a polymerizable monomer different from monomers (I) and (II); (IV) a photochromic compound; and (V) a polymerization initiator (see, for example, claim 6), wherein the amounts of monomers (I), (II) and (III) are maintained at the claimed ranges, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the compound in the polymerization curable composition, and the cured product has a tensile strength of 20 Kgf or more. The presently claimed photochromic lens substrate comprises a cured product of the polymerization curable composition discussed above. Applicants respectfully submit that the prior art of record fails to teach or suggest a polymerization curable composition or photochromic lens substrate as presently claimed.

As noted above, both the cured product of a polymerization curable composition in the photochromic lens substrate of claims 1 and 4 of the present application and the cured product of the polymerization curable composition for a photochromic substrate in claims 6 and 9 of the present application have a tensile strength of 20 Kgf or more.

Since the cured product of the present polymerization curable composition contains components in the claimed ratios (see claims 1, 4, 6 and 9), it can have a tensile strength of 20 Kgf or more. However, Applicants submit that a cured product of a polymerization curable composition containing the present components would not inherently have a tensile strength of 20 Kgf or more.

EP '038 discloses a curable composition comprising a radically polymerizable monomer having an alkoxysilyl group as an essential component and a photochromic cured product which is a cured product of the composition. However, EP '038 fails to disclose a polymerization

curable composition which provides a tensile strength of 20 Kgf or more and also fails to suggest that a cured product having a tensile strength of 20 Kgf or more is obtained from a polymerization curable composition which contains the presently claimed components in the ratios claimed.

As previously discussed and as evidenced by the Declaration Under 37 C.F.R. 1.132 filed on January 8, 2008, the tensile strength of the cured product of EP '038 is not 20 Kgf (as presently claimed), but rather 18.5 Kgf. The reason for this seems to be that the radically polymerizable monomer having an alkoxysilyl group as an essential component reduces the tensile strength of a cured product, although it improves adhesion to a hard coat.

As the Examiner is aware, the present invention and EP '038 have an inventor in common. At the time the invention of EP '038 was developed, there was no demand for rimless spectacle lenses having a photochromic function and high tensile strength. Demand for rimless spectacle lenses arose only after the teachings of EP '038 became public knowledge. The present invention was developed as a result.

The present invention makes it possible to provide a photochromic lens substrate which has such high strength and toughness that it can be used in rimless spectacles. In addition, it provides a lens substrate having excellent photochromic properties, such as high optical density and high fading speed.

Applicants have discovered that the above object can be attained by utilizing the claimed components in the claimed ratios (see claims 1, 4, 6 and 9). For instance, the ratio of the components when the polymerization initiator is a thermopolymerization initiator (claims 1 and 6) differs from that when the polymerization initiator is a photopolymerization initiator (claims 4

and 9). It is clear that the claimed ratios of components would not have been obvious to one skilled in the art.

The present inventors have discovered a curable composition which exhibits a good balance between tensile strength (20 Kfg or more) and photochromic property, and produces a superior material for a photochromic lens substrate, said composition comprising the above described claimed components (including either a thermo or photo-initiator) in the claimed ratios. Prior to the present invention, the use of components (I), (II) and (III) in the claimed ratios, in order to achieve a high tensile strength and superior photochromic properties suitable for a photochromic lens substrate, had been unknown.

Clearly, the cited reference fails to teach or suggest every limitation of the instant invention and thus fails to render the same obvious. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

**EP '038 in view of secondary references**

Claims 1-2, 4, 6, 8, 11 and 13 stand rejected under 35 U.S.C. 103(a) as obvious over EP '038 in view of Imura et al. (U.S. 5,556,931) (hereinafter Imura '931). Additionally, claims 1, 4, 12 and 14 stand rejected as obvious over EP '038 in view of Geffcken et al. (U.S. 3,713,869) (hereinafter Geffcken '869). Applicants respectfully traverse.

The Examiner acknowledges that EP '038 is silent with regard to higher (m+n) values in the bifunctional polymerizable monomer (II). The Examiner further acknowledges that EP '038 is silent with regard to the use of a buffer layer interposed between the substrate and the hard

coating layer. The Examiner relies on the teachings of Imura '931 and Geffcken '869 to overcome these deficiencies.

Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness. As discussed above, EP '038 fails to teach or suggest the presently claimed curable compositions. Thus, it follows that EP '038 does not teach or suggest the present photochromic lens substrate, which comprise the claimed curable compositions. Imura '931 and Geffcken '869 fail to cure the deficiencies of EP '038.

Imura '931 is directed to a polymerizable composition comprising at least two di(meth)acrylate compounds of the specific general formula (I), the polymerizable composition being suitable as a transparent resin. Geffcken '869 discloses a method of applying hard inorganic layers to plastics. However, both Imura '931 and Geffcken '869 fail to teach or suggest any components which could be used to provide a cured product having a tensile strength of 20 Kgf or more. The disclosure of soft and hard monomers in Imura '931 does not provide any guidance for a person skilled in the art to arrive at the present invention. Thus, both references fail to teach a polymerizable curable composition or photochromic lens substrate as presently claimed.

Moreover, Applicants note that the Examiner states in item 51 of the outstanding Office Action that "claims 6, 9 and 10 of the present application do not require a cured product having a specific tensile strength" (i.e. 20 Kgf or more). Applicants submit that this argument is moot in view of the amendments herein.

Evidently, the cited references, alone or in combination, fail to teach or suggest every limitation of the instant invention. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

**Issues Under 35 U.S.C. 112, 2<sup>nd</sup> paragraph**

Claims 1-2 and 4-14 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Applicants respectfully traverse.

The Examiner asserts that claim 1 describes a “photochromic compound (IV)”, whereas claim 4 limits the half-life of the “photochromic compound (III)”. Additionally, the Examiner asserts that certain terminology in claims 4, 6 and 9 render these claims indefinite.

As to the rejection of claims 1 and 4, Applicants respectfully submit that it appears that the Examiner is relying on the original version of the claims, rather than the Article 19 amendments filed on September 19, 2005 (two separate documents titled “Amendment (Under PCT Article 11)” were filed on said date, as reflected by PAIR). Thus, Applicants respectfully request that the rejection of these claims be reconsidered and withdrawn, as outstanding claims 1 and 4 do not contain the phrases cited by the Examiner.

As to the rejection of claims 4, 6 and 9, Applicants have amended these claims in accordance with the Examiner’s helpful suggestions. Accordingly, the rejection of these claims is moot.

Reconsideration and withdrawal of this rejection are thus respectfully requested.

**Double Patenting**

Claims 6, 9 and 10 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 2 of U.S. 6,802,993 to Momoda et al. (hereinafter Momoda '993). Applicants respectfully traverse.

The Examiner asserts that presently pending claims 6, 9 and 10 are directed to curable compositions comprising (I) a monomer represented by formula (1), (II) a monomer represented by formula (2), (III) a polymerizable monomer other than (1) or (2), (IV) a photochromic compound, and (V) polymerization initiators. The Examiner asserts that "specific embodiments of these formulae result in compositions that overlap with U.S. 6,802,993".

Applicants respectfully submit that present claims 6, 9 and 10 are patentably distinct from claims 1 and 2 of Momoda '993. As discussed above, the polymerization curable compositions of claims 6, 9 and 10 of the present application comprise (I) a polyfunctional polymerizable monomer of formula (1); (II) a bifunctional polymerizable monomer of formula (2); (III) a polymerizable monomer different from monomers (I) and (II); (IV) a photochromic compound; and (V) a polymerization initiator, wherein the amounts of monomers (I), (II) and (III) are maintained at the claimed ranges, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the compound in the polymerization curable composition, and the cured product has a tensile strength of 20 Kgf or more.

The composition of claim 6 comprises a thermopolymerization initiator as the polymerization initiator (V), 1 to 15 wt% of component (I), 10 to 80 wt% of component (II) and 5 to 89 wt% of component (III). The composition of claim 9 comprises a photopolymerization



initiator as the polymerization initiator (V), 1 to 60 wt% of component (I), 10 to 90 wt% of component (II) and 0 to 89 wt% of component III. Due to the components present in the polymerizable curable compositions of claims 6 and 9, as well as the claimed ratios of these components, the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of the photochromic compound (IV) in the polymerization curable composition, and the cured product (substrate) of the polymerization curable composition has a tensile strength of 20 Kgf or more.

Claims 1 and 2 of Momoda '993 do not include a polymerization initiator, and do not include a limitation that the fading half-life period of the photochromic compound (IV) in the cured product is 30 times or less shorter than the fading half-life period of this compound in the polymerization curable composition. Moreover, claims 1 and 2 of Momoda '993 do not require that the tensile strength of the cured product be 20 Kgf or more (as discussed above, the tensile strength of the cured product of Momoda '993 is 18.5 Kgf).

Thus, Applicants respectfully submit that present claims 6, 9 and 10 are patentably distinct from claims 1 and 2 of Momoda '993. Reconsideration and withdrawal of this rejection are respectfully requested.

**Conclusion**

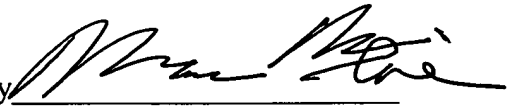
All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Marc S. Weiner, Reg. No. 32,181 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

By 

Marc S. Weiner

Registration No.: 32,181

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant